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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,326	10/04/2004	Anshuman Razdan	12505.006	6242

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EXAMINER

THAI, HANH B

ART UNIT	PAPER NUMBER
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2163

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/03/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/510,326

Applicant(s)

RAZDAN ET AL.

Examiner

Hanh B. Thai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 October 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>10/4/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This is a Non-Final Office Action in response to the application filed April 4, 2003.

Claims 1-25 are pending in this application.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on October 4, 2004 has been considered and entered into record. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Objections

3. Claim 16 is objected to because of the following informalities: semicolon “;” in the preamble of the claim should be substituted with colon “:”. Appropriate correction is required.

Drawings

4. The drawings are objected to because Figs 2-3 (sheets 2-5) and Figs. 45-47 (sheets 19-27) are not readable. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after

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the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-6 and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Peurach et al. (US 6,173,066 B1).

Regarding claim 1, Peurach discloses a computer system for storing, archiving, querying and retrieving information relating to three-dimensional objects; the system comprising:

- data acquisition means for acquiring point coordinate data about the three-dimensional object (Fig.1; Fig. 2; col.3, lines 45-50, Peurach discloses "image acquisition" that acquiring image data about the three-dimensional object);
- a database component (abstract and summary, Peurach);
- a processor ("web image server", Fig. 18) operable to:
 - o generate modeled data from the point coordinate data (Fig.1; Fig. 2; col.7, line 64 to col. 8, line 16 and col.10, lines 57-62, Peurach discloses generating model vector or object models from coordinate data);

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- segment the modeled data into feature data representing a plurality of features of the object (Fig. 1; Fig. 2 and col 2, lines 29-38, Peurach discloses “segmentation of the image into object features”);
- store the modeled data and the feature data in the database component (Fig. 17-18 and col. 10, line 62 to col. 11, line 5, Peurach discloses storing image data); and
- retrieve modeled data and feature data from the database using search criteria comprising representing an object feature (col. 10, line 62 to col. 11, line 7, Peurach discloses “user’s request” corresponding to the claimed “retrieve modeled data and feature data from the database including search criteria” and “send results back to the user terminal including object models” corresponding to the claimed “representing an object feature”); and
- a user interface (“image client”, Fig. 18) operative with the processor (“web image server”, Fig. 18) to: input to the processor search criteria (col. 10, line 62 to col. 11, line 7, Peurach discloses “user’s request” corresponding to the claimed “retrieve modeled data and feature data from the database including search criteria”; and display data retrieved by the processor as a representation of an object feature (col. 10, line 62 to col. 11, line 7, Peurach discloses “user’s request” and “send results back to the user terminal including object models” corresponding to the claimed “retrieving” and “representing an object feature”).

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Regarding claims 2 and 17, Peurach discloses wherein the point coordinate data is surface data (Fig.4).

Regarding claims 3 and 18, Peurach discloses wherein the point coordinate data is volume data (Fig.12-13, Peurach discloses “array” in coordinate data corresponding to “volume data”).

Regarding claim 4, Peurach discloses wherein the feature data represents a point (Figs. 2-4 and Figs.12-13, Peurach).

Regarding claim 5, Peurach discloses wherein the feature data represents a curve (Figs.1-2 and col.2, lines 7-26, Peurach).

Regarding claim 6, Peurach discloses wherein the feature data represents a facet on a surface (Figs. 2-4 and Figs.12-13, Peurach).

Regarding claim 16, Peurach discloses a method for storing, archiving, querying and retrieving information relating to 3D objects; the system comprising:

- acquiring point coordinate data from a physical object (Fig.1; Fig. 2; col.3, lines 45-50, Peurach discloses “image acquisition” that acquiring image data from the three-dimensional object);
- generating modeled data from the point coordinate data (Fig.1; Fig. 2; col.7, line 64 to col. 8, line 16 and col.10, lines 57-62, Peurach discloses generating model vector or object models from coordinate data);
- segmenting the modeled data into feature data representing a plurality of features of the physical object (Fig.1; Fig. 2 and col 2, lines 29-38, Peurach discloses “segmentation of the image into object features”);

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- storing the modeled data and the feature data in a database (Fig.17-18 and col.10, line 62 to col.11, line 5, Peurach discloses storing image data); and
- organizing the modeled data and the feature data so that features of the physical object can be automatically extracted (col. 3, lines 1-35 and summary, Peurach discloses model and feature data are organized) for online query and retrieval of the plurality of features of the physical object (col.10, line 62 to col.11, line 7, Peurach discloses “user’s request” and “send results back to the user terminal including object models” corresponding to the claimed “retrieving” and “representing an object feature”).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peurach et al. (US 6,173,066 B1) in view of Hiraga (US Pub. 2003/0076319 A1).

Regarding claims 7 and 19, Peurach discloses all of the claim limitations as discussed above, except wherein the processor is further operable to compress the modeled data. Hiraga discloses method and apparatus for encoding and decoding an object that has a surface as a polygon mesh including compressing the model data (Fig.27; ¶[0007]; [0193]; [0216], Hiraga). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Peurach to include the claimed feature as taught by Hiraga. The motivation of doing so

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would have been to quickly and successfully retrieve and display 3-dimensional object (see ¶[0006], Hiraga).

Regarding claims 8 and 20, Peurach/Hiraga combination discloses wherein the modeled data comprises a triangle mesh and the processor is operable to compress the modeled data using B-spline curves ¶[0142] and [0244], Hiraga).

Regarding claims 9 and 21, Peurach/Hiraga combination discloses wherein the modeled data comprises a triangle mesh and the processor is operable to segment the modeled data using subdivision surface compression (¶[0244]-[0245], Hiraga).

7. Claims 10, 12 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peurach et al. (US 6,173,066 B1) in view of Mangan et al. "partitioning 3D surface meshes using watershed segmentation".

Regarding claim 10, Peurach discloses all of the claim limitations as discussed above, except wherein the point coordinate data comprises a triangle mesh and the processor are operable to segment the modeled data using watershed segmentation method including improved curvature estimation. Mangan discloses partitioning 3D surface meshes using watershed segmentation including the usage of triangle mesh and watershed segmentation in curvature estimation (see sections 1. introduction, 3. watershed algorithm and 4. curvature calculation, Mangan). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Peurach to include the claimed feature as taught by Mangan. The motivation of doing so would have been to compute accurately estimates of the curvature of the surface (see section 4, Mangan).

Regarding claims 12 and 22, Peurach/Mangan combination discloses wherein the point coordinate data comprises a triangle mesh and the processor is operable to segment the modeled data using watershed segmentation (see sections 1. introduction, 3. watershed algorithm and 4. curvature calculation, Mangan).

8. Claims 11 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peurach et al. (US 6,173,066 B1) In view of Haris et al. "Hybrid image segmentation using watersheds and fast region merging".

Regarding claims 11 and 23, Peurach discloses all of the claim limitations as discussed above, except wherein the point coordinate data comprises a triangle mesh and the processor is operable to segment the modeled data using a hybrid segmentation method. Haris discloses Hybrid image segmentation using watersheds and fast region merging (see sections I-V, Haris). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Peurach to include the claimed feature as taught by Haris. The motivation of doing so would have been in order to compute an accurate estimate of the image gradient (see abstract, Haris).

9. Claims 13 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peurach et al. (US 6,173,066 B1) In view of Fernandes "segmentation of SAR images with Weibull distribution".

Regarding claims 13 and 24, Peurach discloses all of the claim limitations as discussed above, except wherein the point coordinate data comprises volume data the processor is operable

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to segment the modeled data using Weibull E-SD fields. Fernandes discloses segmentation of SAR images with Weibull distribution (see pages 24-26, Fernandes). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Peurach to apply the Weibull technique as taught by Fernandes. The motivation of doing so would have been to perform accurately the image segmentation.

10. Claims 14 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peurach et al. (US 6,173,066 B1) In view of Krishnan et al. (US 6,812,925 B1).

Regarding claims 14 and 25, Peurach discloses all of the claim limitations as discussed above, except wherein the point coordinate data comprises volume data and the processor is operable to segment the modeled data using Greedy connected component labeling refinement. Krishnan discloses a map simplification system including the Greedy algorithm (see Fig.3A-C and col.4, lines 30-41, Krishnan). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Peurach to include the claimed feature as taught by Krishnan. The motivation of doing so would have been to maintain a subdivision or segmentation of object at varying levels of detail that preserves the shape features of the region, e.g., the essential geometric characteristics (see col.1, lines 60-67, Krishnan).

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peurach et al. (US 6,173,066 B1) In view of Matusiak et al. "sketch-based images database retrieval", International Workshop on "multimedia information systems", Istanbul, Turkey, September 24-26, 1998.

Regarding claim 15, Peurach discloses all of the claim limitations as discussed above, except wherein the user interface includes a graphic user interface that operates with the processor to allow a sketch-based search of the database. Matusiak discloses sketch-based images database retrieval system including sketch-based retrieval technique (see sections 1-2, Matusiak).). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Peurach to include the claimed feature as taught by Matusiak. The motivation of doing so would have been to provide an efficient and fast system to retrieve images from a database (see section 4.1, Matusiak).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1. Pulla et al. « improved curvature estimation for watershed segmentation of 3-dimensional meshes », April 30, 2001, pages 1-15.

2. Archibald et al. « improving the accuracy of volumetric segmentation using pre-processing boundary detection and image reconstruction”, IEEE transactions on image processing, Vol. 13, No.4, April 2004.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanh B. Thai whose telephone number is 571-272-4029. The examiner can normally be reached on Mon-Thur (7:00AM - 4:30 PM).

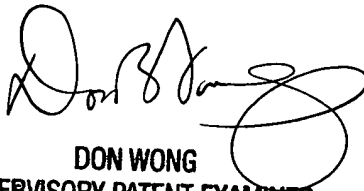
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on 571-272-1834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hanh B Thai
Examiner
Art Unit 2163

March 29, 2007


DON WONG
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100